

REMARKS

Claims 1-3, 5-11, and 14-17 are pending in the application.

By the foregoing Amendment, claim 1 is amended and claims 14-17 are added. Figure 1 of the drawings is amended to add reference numeral 17 and lead lines therefor to designate the bearing plates recited in new claim 14, and the specification is amended to add reference numeral 17. Claims 4, 12, and 13 are canceled without prejudice or disclaimer.

These changes are believed not to introduce new matter, and entry of the Amendment is respectfully requested.

Based on the above Amendment and the following Remarks, Applicant respectfully requests that the Examiner reconsider all outstanding rejections, and withdraw them.

Rejection under 35 U.S.C. § 112, ¶ 1

In paragraph 4 of the Office Action, claim 4 was rejected under section 112, first paragraph, for failure to comply with the enablement requirement. This rejection is overcome by the cancellation of claim 4 without prejudice or disclaimer.

Rejections under 35 U.S.C. § 102

In paragraph 4 of the Office Action, claims 1-3 and 5-11 were rejected under section 102(b) as being anticipated by Smith et al. This rejection is believed to be overcome by the amendments to claim 1.

Claim 1 as amended recites that the trench wall cutter is for cutting trenches of rectangular cross-section, wherein the trench wall cutter has a cutting device comprising, among other features, first, second, third, and fourth cutting wheel wheels drivable in rotary manner, wherein the first and second cutting wheels are arranged in a first pair in rotary manner about a first common rotation axis, the third and fourth cutting wheels are arranged in a second pair in rotary manner about a second common rotation axis, and the first and second common rotation axes are parallel to each other.

The rectangular cross-section of the trenches results from the combination of features that the two cutter wheels of each pair of cutter wheels are arranged on a common rotary axis, and that the two pairs of cutter wheels have parallel rotation axes, as mentioned in the fifth paragraph on page 3 of the specification.

A trench wall cutter that produces trenches of rectangular cross-section is referred to as a “slurry trench wall cutter” or a “diaphragm wall cutter.”* These “trench wall cutters” consist of a frame, on the bottom of which two pairs of cutting wheels are provided. As shown in Endo et al., a trench wall cutter is lowered vertically into the ground while rotating the cutting wheels to give a cuboid-shaped hole in the ground having a rectangular cross-section in the horizontal plane. An extended trench wall is obtained by filling the cuboid-shaped hole with a hardening slurry and by repeatedly raising and lowering the trench wall cutter at adjacent positions.

In contrast, the cutter described by Smith et al. uses cutting wheels to “shave off” the slope of a hill or an embankment located on one side of the device. The operating principal of the device described in Smith et al. can be better understood with the aid of the front page of Patent No.

* Endo et al., which was applied in rejecting claims 1, 12, and 13 under section 103(a) (as discussed below), is an example of a slurry trench or diaphragm wall cutter.

3,778,912 to Swisher, Jr. et al., which is referred to by Smith et al.^{**} The figure of this front page shows a device similar to the device of Smith et al., wherein the “shaving off” is accomplished by a door-like blade 66. Instead of this blade, the device of Smith et al. uses cutting wheels 102 all arranged on the same rotation shaft 58 rotatable by a drive motor 92 (*cf.* figs. 3 and 7 of Smith et al.).

Thus, in contrast to the invention as recited in claim 1, Smith et al. does not disclose two pairs of cutting wheels but rather a multitude of cutting wheels all arranged on the same rotation axis.

Moreover, the cutting device of Smith et al. is unsuitable for cutting trenches with rectangular cross-section, since it can only “shave-off” a side wall of an already existing depression.

In view of the foregoing, it is respectfully submitted that the invention as recited in claim 1, and in claims 2, 3, and 5-11 depending therefrom, is not anticipated by Smith et al., and that the rejection should be withdrawn.

Rejections under 35 U.S.C. § 103

In paragraph 6 of the Office Action, claims 1, 12, and 13 were rejected under section 103(a) as being unpatentable over Endo et al. in view of Smith et al. The rejection of claims 12 and 13 is

^{**} Patent No. 3,778,912 to Swisher et al. is listed on an accompanying Form PTO/SB/08A in order to make it of record. In accordance with 37 CFR 1.98, a copy of Swisher et al. is not submitted. Applicant does not waive any rights to appropriate action to establish patentability over Swisher et al. should it be applied as a reference against the claims of the present application.

It is respectfully requested that the Examiner initial and return a copy of the enclosed Form PTO/SB/08A, and to similarly indicate in the official file wrapper of this patent application that Swisher et al. has been considered.

overcome by their cancellation without prejudice or disclaimer. The rejection with respect to claim 1 is believed to be overcome by the amendments thereto.

Endo et al. does not teach a reversal of the rotation direction of the two pairs of cutting wheels during cutting operation. Rather, during cutting, the left-hand pair of wheels always rotates counterclockwise whereas the right-hand pair of wheels rotates clockwise. By choosing this rotation direction, it is ensured that loose soil cut off by the operation of the cutting wheels is delivered to suction devices 35a and 35b arranged centrally between the two rotation axes of the cutting wheel pairs (*cf.* fig.2, claim 1, column 1, line 5 and column 5, line 48 to column 6, line 9 of Endo et al.).

Consequently, Endo et al. does not render obvious a reversal of the direction of rotation of the cutting wheel pairs during the cutting operation, since this would result in transporting loose soil away from the soil suction device to the walls of the trench, inhibiting further cutting action.

Smith et al. has already been discussed with respect to the rejection under section 102(b). As noted in the Office Action, Smith et al. discloses the rotation of the cutting wheels in reverse directions. Substituting the cutters of Endo et al. with the cutters of Smith et al. would render the device of Endo et al. not merely unsuitable, but actually inoperable for its intended purpose, inasmuch as, as noted in the preceding paragraph, reversal of the direction of rotation of the cutting wheel pairs during the cutting operation would result in transporting loose soil away from the soil suction device to the walls of the trench, inhibiting further cutting action.

It is well-settled that a modification which would render the prior art apparatus inoperable for its intended purpose does not establish a *prima facie* case of obviousness. *In re Gordon*, 221

USPQ 1125, 1127 (Fed. Cir. 1984) (citing *In re Imperato*, 179 USPQ 730, 732 (CCPA 1973) and *In re Schulpen*, 157 USPQ 52, 55 (CCPA 1968)).

In view of the foregoing, it is respectfully submitted that the invention as recited in claim 1 is patentable over Endo et al. in view of Smith et al., and that the rejection should be withdrawn.

Conclusion

All rejections have been complied with, properly traversed, or rendered moot. Thus, it now appears that the application is in condition for allowance. Should any questions arise, the Examiner is invited to call the undersigned representative so that this case may receive an early Notice of Allowance.

Favorable consideration and allowance are earnestly solicited.

Respectfully submitted,

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